Perception of Nursing Professionals Towards eHealth Application

Rajesh Kumar Sinha[1], Merlin Thankachan[2]

1Associate Professor,
2 Student,
Department of Health Information Management, MCOAHS, Manipal University, Manipal-576104, Karnataka, INDIA
rajesh.sinha@manipal.edu, merlinmcoahs@gmail.com

ABSTRACT

Background: eHealth is one of the most promising applications in Health Care Sector. A well designed eHealth application assists the nursing professionals with easy access to the information about the patient, health and disease for achieving high quality patient care. This study was conducted with an aim to assess the level of perception of nursing professionals towards eHealth applications. **Methodology:** A prospective study was conducted among 52 Nursing Professionals of a nursing college of Southern India. A validated questionnaire consisted of 26 question based on 5 point Likert scale ranging from Strongly Agree to Strongly Disagree with a score of 5 to 1 were administered to the participants after getting their due consent. **Result:** The perceptions were assessed on different aspect of eHealth application. The parameters where more than 80% of the nursing professionals agreed were mainly related to the support of eHealth applications in securing patient information, quality decision making in patient care and evaluating and enabling evidence based patient choice. More than 95% of the nursing Professionals agreed that the online research database, video conferring, web casting and online continuing medical education program can assist the health care practitioner in updating their knowledge in their respective domain. About 90% of the nursing professionals felt that the information generated through computerized health management information system assist the public health administrators in capturing and reporting public health information of the community and also in understanding their healthcare needs. The nursing professionals also agreed to the fact that the e-claim can assist the patients and providers in fast and easy claim processing and also in improving the productivity of the hospital. All the nursing professionals felt the need of such application in all the hospital for providing healthcare to the patient and community. **Conclusion:** The study reported high level of perception about eHealth application among nurses but there were few of them who had no opinion about these applications in patient care, research and education, public health and in administration. The awareness and training program could be a better platform to improve the level of perception and acceptability of these applications among the nursing professionals.

Keywords: eHealth, Perception, Nursing Professionals, patient care.

INTRODUCTION

Healthcare is one of the most knowledge-intensive industries and the goal sets for the modern healthcare is both ambitious & challenging. To deliver quality healthcare to individual and the community, modern healthcare practitioners are very much depended on the information related to healthcare and disease management. This information is continuously generated and resides in many locations where the major challenge is the real time access by many stakeholders at a given point of time. The changing trends and adoption of information and communication technology in healthcare settings have equipped the modern healthcare providers with a mean to resolve their day to day challenges in enhancing quality healthcare, reducing operating cost, improving productivity & efficiency through good management of patient flows and also optimizing the utilization of expensive equipment and manpower [1]. Since last three decades, with the rapid growth of Internet and WWW has originated the concept of 'eHealth'. eHealth connotes the convenience, low cost, and ready accessibility of health related information and communication using the internet and associated technologies such as email and World Wide Web. It has created a channel for placing very large amounts of healthcare information at the fingertips of anyone who seeks it.

eHealth shifts the locus of control over healthcare data and information in the direction of consumers and their partners. It is not only helping the healthcare providers in gathering information related to ongoing research and recent development in medicine but also adding knowledge to the consumers regarding health and disease. The increasing expectation and demands of healthcare team, new medical technologies, changing pattern of payment and reimbursement scheme, transition of paper to electronic health records, healthcare consumer movement are several trends which drives the adaptation of eHealth applications in modern healthcare setting [2]. eHealth applications includes the electronic collection, storage, use, sharing and management of healthcare information. This information can include the patient's identification, clinical, nursing, diagnostic test results, discharge summary, referrals diagnoses and medication history [3]. As per World Health Organization, "eHealth is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research" [4]. eHealth is a rapidly evolving component of healthcare and is a basic requirement for providing general practice care in the 21st century [5]. Broderick Meg & Smaltz defined eHealth as an application of Internet and other related technologies of healthcare industry to improve

the access, effectiveness, efficiency and quality of clinical and business process utilized by healthcare institution, providers and consumers with an aim to improve the healthcare status of the community [6].

The nursing professionals are involved in 24 hour direct patient care and this process gets easier when the patient information become easily available to them at the time of need. In order to understand the technological development that took place in patient care and to provide quality patients care, they should have the positive perception towards the eHealth application in patient care.

METHODOLOGY
A prospective study was carried out among 52 nursing professionals of a Nursing College of Southern India. A validated questionnaire was used for the data collection. The questionnaire consists of 26 items regarding the e-health application in Patient care, Administration, Public Health, Research and Education and overall perception. A point Likert scale from strongly agree to strongly disagree (score 5 to 1) was considered to measure the perception of the participants towards eHealth Application. The questionnaire was administered to the respondents after taking consent from the concerned institutional authorities. The respondents were first briefed about the study and its objectives and the purpose of survey. An informed consent was obtained from the respondents for being the part of the study where the data are collected by distributing the questionnaire among those who were willing to respond. The respondents were asked to mark their response on a given parameter based on 5 point Likert scale from strongly agree to strongly disagree. The Statistical Package of Social Science (SPSS) version 16.0 was used to calculate the perception level of the professional in terms of frequency and percentage and presented in the form of tables. The chi-square test was done and $p<0.05$ was considered significant.

RESULT AND DISCUSSION
A non- parametric test was run to find out the statistical significance of the finding from the response to the 26 question on perception towards eHealth Application which was subdivided into 5 categories:
- eHealth Application In Patient Care
- e-health Application In Research & Education
- e-health Application In Public Health
- e-health Application In Administration
- overall perception about eHealth Application

Among the dimensions studied, finding about perception about eHealth application were found to be significant ($p<0.05$) with most of the parameters included in the questionnaire. The detailed discussion of each parameter is as follows:

1. **Institution-wise distribution of the respondents**
   A total of 52 Nursing Professionals were recruited for the study and their response were noted to understand their level of perception related to the role of eHealth application in Patient care, Research and Education, Public Health, Administration.

2. **Gender Wise Distribution of the respondents**
   Out of 52 Nursing Professionals, 4 (7.7) were male and 48 (92.3) were female. (Table 1)

3. **Department wise distribution of Nursing Professionals**
   As per the survey result, among 52 Nursing Professionals, 12(23%) respondents were from Medical Surgical Department, 9(17.3%) each from Community Health, OBG, Pediatric department, 7(13.4%) from fundamentals of nursing and 6(11.5%) from Psychiatric Department. (Table 2)

4. **Distribution of respondent based on their working experience of (in years)**
   Among Nursing professionals 26(50%) had experience of 1 to 5 years, 16(30.8%) had experience of 6 to 10 years, 8(15.4%) had experience of 11 to 15 years and 2(3.8%) had experience of 16 to 20 years. (Table 3)

5. **Distribution of respondent based on their Designation**
   Among 52 nursing professionals, 9(6.3%) were Associate Professors, 17(12%) Assistant Professors, 5(3.5%) Lecturers and 21(14.8%) were Assistant Lecturers. (Table 4)

6. **eHealth Application in Patient Care**
   All Nursing Professionals who completed the survey offered a very positive opinion about the support of eHealth application in patient care. More than 90% of Nursing Professionals agreed that the online information sources add knowledge to the consumer regarding the health care providers and their location; electronic health record and computerized health information system improve the sharing and real time access of patient information at a given point of time. The parameter where more than 80% of the nursing professionals agreed were mainly related to eHealth applications supports in maintaining secure patient information, quality decision making in patient care and evaluation. They also felt that the eHealth has opens a new avenues for patient centered medicine and enable evidence based patient choice. All the nurses agreed that the websites addressing consumer's healthcare needs creates awareness regarding the disease and health of the community. The study conducted by Huong

Q. Nguyen et.al showed that the online information provide patient, families and health provider with unparalleled opportunities to learn, inform and communicate with each other [7].

The response received from nursing professionals were found to be statistically significant (p<0.05) in relation to the support of e-health applications in communication for delivering the quality healthcare and Adopting the telemedicine for monitoring the patient located at remote area for providing various diagnostic and curative therapies. (Table 5)

7. eHealth Application In Research & Education

About 98% of Nursing Professionals agreed that the eHealth applications such as Videoconferencing, web-casting, online continuing medical education program can update the healthcare team with the recent advancement in their respective domain whereas 96.2% felt that the e-health has the potentials in collaborating geographically dispersed researcher on a single platform and share their expertise to resolve various issues related to health disease of individual and community. All the respondents agreed that the Electronic journals, textbooks and other online publication and research database are very cost effective in nature in terms of gathering information about the ongoing research in their respective domain. The study conducted by Helen Richards et.al also showed similar result where most of the respondents felt that the applications such as videoconferencing and online access of patient information assists them in improving the patient outcome and collaborative research [8]. (Table 6)

To understand whether the years of working experience create an impact in perceiving the fact about eHealth application, the response related to the eHealth application in collaborating the geographically dispersed researcher was found to be statistically significant (p<0.005). (Table 6)

8. eHealth Application In Public Health

When asked whether the Information generated through computerized health management information system assist the public health administrators in understanding the heath care need of the community, more than 90% of Nursing Professionals agree to the same. The similar responses were also seen about the eHealth application in enhancing and simplifying the processes of communication between the consumer and heath care providers. They felt that

the handheld devices such as laptop and Ipads can equip the public health professional in capturing and disseminating the information of the community without any delay and will empower them in managing health information system of the community in a simplified manner. The study conducted by Don E Detmer et.al states that the public and private sectors will need to collaborate to build a health information infrastructure, essentially a 'paperless' health care system for proving the better services to the community [9]. (Table 8)

The finding related to the Telemedicine and Telehealth support in delivering quality healthcare; HMIS supports in managing health information system and eHealth application in enhancing and simplifying the process of communication were found to be statistically significant with the working experience of the nursing professionals (p < 0.05).

9. eHealth Application In Administration

In response to the query whether e-billing and e-claiming can support the patient and providers in electronic transaction and easy claim processing, more than 94% of the respondents agreed whereas 1.9% disagreed with the same. eHealth application has a great potential in supporting the healthcare professionals as well as administrators in real time access of health statistics for planning and scheduling the health care program in the hospital as well as [2]. In view to this, more than 92% of the respondents agreed whereas 5.8% of the respondents did not have any opinion. About 92% of the respondents felt that the eHealth applications improve the productivity of the hospital and increase efficiency by reducing the cost of healthcare. Mohsen Anvari et.al review claimed that the electronic data interchange has reduced the total inventory cost by reducing the lead time, uncertainty, and ordering cost [10]. (Table 8)

10. Overall perception about eHealth application

All nursing professionals agreed that the eHealth application should be implemented and practiced in each healthcare facility for patient care, education and research. The perception level of the nursing professionals was found to be high due to the reason that they are exposed to the eHealth technology for the management of patient information, decision making in patient care and also for the administrative purposes. They mentioned that the eHeath technology is a boon to the healthcare team for providing better and quality services to the patient and community.

Table 1. Gender Wise Distribution of the respondents

Gender	Nursing Professionals	
	Frequency	Percentage
Male	4	7.7
Female	48	92.3
Total	52	100.0

Table 2. Department wise distribution of Nursing Professionals

Department	Gender (n=52)				Total	
	Male		Female			
	f	*%*	*f*	*%*	*f*	*%*
Community health	1	1.9	8	15.4	9	17.3
Fundamentals of Nursing	2	3.8	5	9.6	7	13.4
Medical Surgical	1	1.9	11	21.1	12	23.0
Obstetrics & Gynecology	0	0	9	17.3	9	17.3
Pediatric	0	0	9	17.3	9	17.3
Psychiatric	0	0	6	11.5	6	11.5

Note: n=Total Number of Respondents, *f*=Frequency

Table 3. Distribution of respondents based on their working experience (in years)

Years of Experience	*f*	*%*
1-5	26	50.0
6-10	16	30.8
11-15	08	15.4
16-20	02	3.8
Total	**52**	**100**

Note: *f*=Frequency

Table 4. Distribution based on Designation

Designation (n=52)							
Associate Professor		Assistant Professor		Lecturer		Assistant Lecturer	
f	*%*	*f*	*%*	*f*	*%*	*f*	*%*
9	6.3	17	12.0	5	3.5	21	14.8

Note: n=Total Number of Respondents, *f*=Frequency

Table 5. eHealth Application in Patient Care

Parameter	Response (n=52)			Chi-Square	p-Value
	A (%)	NO (%)	D (%)		
Websites addressing consumer's healthcare needs creates awareness among consumers.	100	0	0	14.367	.571
Online information sources add knowledge to the consumer.	94.3	3.8	1.9	56.848	.179
e-health applications build and support communication in delivering quality health are.	94.3	3.8	1.9	68.580	**.027**
EHR and computerized HIS improve the sharing and real time access of patient information	92.3	5.8	1.9	59.728	.119
e-Health applications supports in maintaining secure patient information.	86.5	9.7	3.8	51.670	.332
Telemedicine support for continuous home based geriatric care, children with disability and patient with chronic illness.	80.7	13.5	5.8	59.677	.120
Adoption of telemedicine support health care team in monitoring the patient located at remote area for providing various diagnostic and curative therapies.	78.8	17.3	3.9	1.036	**.001**
Decision support systems assist in quality decision making in patient care and evaluation.	86.8	7.4	5.8	58.777	.137
e-health opens new avenues for patient centered medicine and enable evidence based patient choice	86.6	7.4	5.8	49.437	.416
e-health adoption enable improved treatment outcome and encourage evidence based practice.	90.4	5.8	3.8	58.307	.146
e-health applications build a relationship between the patient and health care professional toward a true partnership where the decision are made in a shared manner.	88.4	5.8	5.8	61.529	.091

Note: n=Total Number of Respondents, A=Agree, NO=No Opinion, D=Disagree

Table 6. eHealth application in Research & Education

Parameter	Response (Total Number=52)			Chi-Square	p-Value
	A (%)	NO (%)	D (%)		
Video conferring ,web casting, online continuing medical education program help the health care practitioner in updating knowledge in their respective domain	98	2	0	36.342	.273
Online source such as web seminar and continuing medical education assist in education and research.	100	0	0	13.781	.615
Electronic publication and research data base are very cost effective in nature in terms of gathering information about ongoing research and recent development in the respective domain.	100	0	0	16.801	.399
e-health collaborate geographically dispersed researcher on a single platform and share their expertise to resolve various issues related to health disease of individual and community	96.2	1.9	1.9	**72.284**	**.013**

n=Total Number of Respondents, A=Agree, NO=No Opinion, D=Disagree

Table 7. e-health Application In Public Health

Parameter	Response (Total Number=52)			Chi-Square	p-Value
	A (%)	NO (%)	D (%)		
e-health application such as Telemedicine and Telehealth assist in delivering quality services to a large group of patient in case of any natural disaster.	92.3	7.7	0	**60.321**	**.002**
Health Management Information System (HMIS) empowered the public health administrator in managing health information system of the community in a simplified manner.	92.3	5.8	1.9	**80.160**	**.002**
Information generated through Computerized health management information system assist the public health administrators in understanding the heath care need of the community	98.1	0	1.9	31.180	.508
Hand-held devices equips the public health professional in capturing and disseminating the patient information without any delay	92.3	5.8	1.9	65.653	.055
E-health application enhances and simplifies the process of communication between the consumer and heath care providers.	94.2	3.9	1.9	**74.296**	**.009**

n=Total Number of Respondents, A=Agree, NO=No Opinion, D=Disagree

Table 8. e-health Application In Administration

Parameter	Response (n=52)			Chi-Square	p-Value
	A (%)	NO (%)	D (%)		
e-billing support the electronic transaction and payment for the services availed by the patients	98.1	0	1.9	33.370	.401
e-claim processing assist the patients and providers for fast and easy claim processing and management	94.2	3.8	1.9	42.950	.679
Real time access of health statistics assist in planning and scheduling the health care program in the hospital	92.3	7.7	0	29.990	.569
e-health applications improve the productivity of the hospital	92.3	5.8	1.9	59.017	.132
e-health increases efficiency in health care thereby decreasing the cost	92.3	5.8	1.9	58.605	.140

n=Total Number of Respondents, A=Agree, NO=No Opinion, D=Disagree

Table 9. Overall perception about eHealth Applications

Parameter	Response (n=52)	
	Yes (%)	No (%)
Do you think that the e-health applications should be implemented and practiced in each health care facility for patient care, education and research?	100	0

CONCLUSION

eHealth Application plays a vital role in making information available to the healthcare professionals in providing quality healthcare to the patient. As a member of healthcare team, nursing professionals always seek the health information at their fingertip for providing round the clock continuous healthcare services to patient under care. The study result revealed that the perception level of the nursing professionals was high with respect to the support of eHealth application in patient care, research and education, public health and administration. With having good perception level, there were few aspects such as Telemedicine, Decision Support System, eHealth supports in evidence based practice, real time access etc. where they did not have any opinion. The need felt is to conduct awareness and training sessions to improve their understanding about the eHealth application and utilization as this will directly contribute in improving their perception level and use of the systems.

REFERENCES

[1]   Ball J Marison (n.d).*E-health empowering clinicians and consumers*. Retrieved October   2008, from Website:
http://www.himss.org/content/files/proceedings/2001/roundtab/rslides/rsl08.pdf

[2]   Jai Ganesh. A. U. *E-health - drivers, application, challenges ahead and strategies: A   conceptual framework.* Indian Journal of Medical Informatics. 2004 1 (1). 39-48

[3]   [Pearce C, Haikerwal MC. E-health in Australia: time to plunge into the 21st century. Med J Aust 2010;193(7):397–8   [Internet]Available at   URL: http://curriculum.racgp.org.au/statements/e-health/

[4]   eHealth.[Internet]   Available   at   URL: http://www.openclinical.org/e-Health.html

[5]   Organization WH. E-health. Geneva: World Health Organization.   Available   at www.who.int/trade/glossary/story021/en/index.html

[6]   Broderick Meg., & Smaltz D H (2003). *E-health defined*. Retrieved October 2008 from HIMSS E-health   SIG.   Website: http://www.himss.org/content/files/eHealth_whitepaper.pdf

[7]   Huong Q. Nguyen, Virginia Carrieri-Kohlman, Sally H. Rankin, Robert Slaughter , Michael S. Stulbarg: Internet-based patient education and support interventions: a review of evaluation studies and directions for future research. Volume 34, Issue 2, March 2004, Page 95-112, Available at URL. http://www.sciencedirect.com/science/article/pii/S0010482503000465

[8]   Helen Richardsa, Gerry Kinga, Margaret Reidb, Sivasubramaniam Selvaraja, Iain McNicolc, Eileen Brebnerd, David Goddena. Remote working: survey of attitudes to eHealth of doctors and nurses in rural general practices in the United Kingdom. Family Practice, Volume 22(1):2-7 , 2005.[Internet] Available   at

URL:http://fampra.oxfordjournals.org/content/22/1/2.full

[9]   Don E Detmer: Building the national health information infrastructure for personal health, health care services, public health, and research. Volume 3(1), Published 6 January 2003.[Internet]Available at URL: http://www.biomedcentral.com/1472-6947/3/1

[10]   Mohsen Anvari, Electronic data interchange and inventories. Volume 26, Issue 1-3, Page no 135-143.[Internet]   Available   at   URL: http://www.sciencedirect.com/science/article/pii/092552739290055C